

## **Appendix E: Supporting Documentation for Chapter IV.**

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## Using Appendix E

The purpose of this appendix is to provide the detailed methods and supporting documentation that are the underpinnings of the main body of the report but too detailed or extensive to report there. This appendix provides background to the information contained in Chapter IV of the main body of the report. Information is included in this appendix only if the authors believed that details needed to be documented.

# Wetland Resources Within the SR-167 Project Area

## Introduction

An inventory and assessment of wetland resources in the project area is used to estimate potential project impacts to wetland resources and facilitate wetland avoidance and minimization during project planning and design. This report provides detailed information on wetland resources in and adjacent to the project area.

## Methods

Existing Washington State Department of Transportation wetland inventory data developed for earlier transportation projects on the SR-167 corridor were compiled and used as foundational information on wetland resources. Our wetland biologist developed a set of reference maps of the project area with all available wetland inventory data overlaid on color orthophotos. These maps were taken into the field from December 2004 to January 2005 and used to verify the location and extent of each mapped wetland as well as identify new wetlands within the project area. Revisions to existing wetland boundaries were noted on field maps and transferred to the SR-167 wetland data layer in ArcMap. Wetland determinations are based on methods set forth in the Washington State Wetlands Identification and Delineation Manual (Ecology, 1997). All wetland area calculations are estimates based on a visual assessment and are not intended to be technically rigorous wetland delineations. Wetland function assessments were completed using the Wetland Functions Characterization Tool for Linear Projects (WSDOT, 2000). Upon completion of the inventory, all wetland data were entered into a GIS layer that also included wetlands identified by aerial photo interpretation. Wetland classifications were taken from Cowardin et al., (1979), where P stands for a Palustrine system, and the classes are EM for emergent, AB for aquatic bed, SS for scrub-shrub, and FO for forested. Methods follow Gersib et al. (2004) Part II, Step 3.

## Results

Wetland resources on and adjacent to the project area are below by project segment and also shown on Figures 60 through 62 (Existing Aquatic and Fish Resources) in the main body of this document. Further detail is provided in Table D-1, Functional Assessment of Wetlands within the Project Area, below.

### Segment 1

Wetland AAE-36 is a PEM depressional flow-through site in the median at the far southern end of the project area. The dominant vegetation is reed canary grass and the approximate area is 5 acres. The Ecology Rating is a Category III and there is some restoration potential here if fill is removed. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment and large wood are at risk and the location does not meet the high criteria. The GIS identification number is 1421.

Wetland AAE-31 is a PEM depressional flow-through site in the cloverleaf between SR-167 and the southbound on-ramp to SR-512, at about milepost 6. The dominant vegetation is reed canary grass and the approximate area is 2 acres. The Ecology Rat-

ing is a Category III and there is some restoration potential here if fill is removed. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are at risk and the location does not meet the high criteria. The GIS identification number is 1422.

Wetland AAE-24 is a PEM depressional flow-through site in the cloverleaf between SR-167 and the northbound on-ramp from SR-512, at about milepost 6. The dominant vegetation is reed canary grass and the approximate area is 2 acres. The Ecology Rating is a Category III and there is some restoration potential here if fill is removed. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are at risk and the location does not meet the high criteria. The GIS identification number is 504.

Wetland AAE-32 is a PEM depressional flow-through site in the cloverleaf between the southbound off-ramp from SR-512 to SR167 and the southbound lanes of SR-167, at about milepost 6. The main vegetation is reed canary grass with lesser amounts of stinging nettle and grasses. Approximate area is 2.5 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are risk and the location does not meet the high criteria. The GIS identification number is 1418.

Wetland AAE-33 is a PEM depressional flow-through site in the cloverleaf between the southbound off-ramp from SR-167 to SR-512 and the northbound lanes of SR-167. The main vegetation is reed canary grass with some stinging nettles, grasses and a few black cottonwoods. Approximate area is 2 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are risk and the location does not meet the high criteria. The GIS identification number is 1419.

Wetland AAE-22 is a PEM riverine flow-through site to the south of SR-167 and to the north of the Puyallup River. The dominant vegetation is reed canary grass and blackberries are the non-dominant vegetation. Approximate area is 8 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are at risk and the location does not meet the high criteria. The GIS identification number is 495.

Wetland AAW-16 is a PEM/PSS/PFO depressional flow-through system located between SR-167 and Valley Ave. E. in what is likely a remnant oxbow. Vegetation in-

cludes black cottonwood, Himalayan blackberry and red alders. Approximate area is 2 acres and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 507.

## **Segment 2**

Wetland AAE-23 is a PEM depressional flow-through site between SR-167 and Pacific Ave. Vegetation includes black cottonwood, red alders, Himalayan blackberry, and reed canary grass. The approximate area is 2 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3139.

Wetland AAW-18 is a depressional flow-through detention pond in the northeast corner beside Wetland AAW-17. Because this is a detention pond it does not have an Ecology Rating. Vegetation consists of cattails and soft rush. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 3138.

Wetland AAW-17 is a PEM depressional flow-through system just north of the West Valley Hwy E. underpass for SR-167. Vegetation includes reed canary grass, cattails, willows and a few black cottonwoods. Approximate area is 4 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1551.

Wetland AAE-25 is a PEM riverine flow-through ditch between Wetlands AAE-24 and AAE-26 on the east side of SR-167. The dominant vegetation is reed canary grass, with some Himalayan blackberry and hardhack, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3140.

Wetland AAW-19 is a PEM depressional flow-through site just north of AAW-17 along West Valley Hwy. E. Vegetation includes reed canary grass, blackberries and cattail. Approximate area is 8 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment, water and overall aquatic integrity are at risk and the location does not meet the high criteria. The GIS identification number is 542.

Wetland AAW-15 is a PEM riverine flow-through ditch extending south of Wetland AAW-14 between SR-167 and some commercial areas. The dominant vegetation is reed canary grass, with some Himalayan blackberry and cattail, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3137.

Wetland AAW-21 is a PFO riverine flow-through system on the east side of West Valley Hwy E. Vegetation includes black cottonwood, red alder and Himalayan blackberry. Approximate area is 2 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is high, landscape condition is high and the overall condition ranking is high. Landscape scale avoidance is high based on the criteria that the condition of the movement of sediment, water and overall aquatic integrity are at risk and the upslope riparian areas and forest are intact. The GIS identification number is 590.

Wetland AAW-14 is a PEM/PSS/PFO depressional flow-through site between West Valley Hwy E. and the mainline and north of 32<sup>nd</sup> Street E. Vegetation includes black cottonwood, Himalayan blackberry, red alders and reed canary grass. Approximate area is 48 acres and the Ecology Rating is a Category III. This site has restoration and mitigation potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment, water and overall aquatic integrity are at risk, the upslope riparian area has minimal alteration and the location does not meet the high criteria. The GIS identification number is 1548.

Wetland AAW-13 is PEM/PSS/PFO riverine flow-through site that contains isolated forest area and a current mitigation site. Vegetation includes black cottonwood, red alder, willows, blackberry, and reed canary grass. The approximate area is 11 acres and the Ecology Rating is a Category III. This is a current mitigation site as well. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment, water and overall aquatic integrity are at risk, the upslope riparian area has minimal alteration and the location does not meet the high criteria. The GIS identification number is 1544.

Wetland AAW-11 is a PEM riverine flow-through site south of 27<sup>th</sup> Street Court E. and west of West Valley Hwy E. Vegetation includes cattail, willows and reed canary grass and the approximate area is 2 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment, water and overall aquatic integrity are at risk, the upslope riparian area has minimal alteration and the location does not meet the high criteria. The GIS identification number is 1543.

Wetland AAW-12 is a PEM riverine flow-through ditch between Wetlands AAW-8 and AAW-13. Vegetation includes reed canary grass with a few black cottonwoods

and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3136.

Wetland AAW-10 is a PSS/PFO riverine flow-through site west of the West Valley Hwy E. and directly across from 24<sup>th</sup> Street E. Vegetation includes Himalayan blackberry, alders and reed canary grass. The approximate area is 1 acre and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is high and the overall condition ranking is high. Landscape scale avoidance is high based on the criteria that the condition of the movement of sediment is at risk and the upslope riparian area has minimal alteration. The GIS identification number is 3135.

Wetland AAW-9 is a PEM riverine flow-through site just west of West Valley Hwy E. and north of 24<sup>th</sup> Street E. Vegetation includes Himalayan blackberry, stinging nettles, cattail and reed canary grass with a few weeping willows and alders. The approximate area is 0.6 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope riparian area has minimal alteration and the location does not meet the high criteria. The GIS identification number is 1542.

Wetland AAE-34 is a PEM depressional flow-through system located just north of 24<sup>th</sup> Street E. and on the east side of SR-167. The main vegetation is reed canary grass and blackberry. Approximate area is 18 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1541.

Wetland AAW-8 is a PEM/PSS/PFO riverine flow-through site between the mainline and West Valley Hwy E. and between Wetlands AAW-7 and AAW-12. Vegetation includes black cottonwoods, red alders, willows and reed canary grass. Approximate area is 3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3134.

Wetland AAE-27 is a PEM riverine flow-through ditch at 24<sup>th</sup> Street E. and extending north to Wetland AAE-28. The dominant vegetation is reed canary grass, with some Himalayan blackberry, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3141.

Wetland AAW-7 is a PEM riverine flow-through ditch between Wetland AAW-6A and Wetland AAW-8. Vegetation consists mainly of reed canary grass with a few



black cottonwoods, red alders, willows and cattail. Since this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3133.

Wetland AAW-6B is a PEM/PSS/PFO riverine flow-through site just south of Wetland AAW-6A and in a forested area west of the West Valley Hwy E. Vegetation includes black cottonwoods, western red cedar, red alder, willows and creeping buttercup. Approximate area is 7 acres and the Ecology Rating is a Category II. This can be considered a preservation site. For avoidance and minimization purposes, the site condition is high, landscape condition is moderate and the overall condition ranking is moderate/high. Landscape scale avoidance is moderate/high based on the criteria that the condition of the movement of sediment, large wood and overall aquatic integrity are at risk. The GIS identification number is 3132.

Wetland AAW-6A is a PEM/PSS riverine flow-through site between Jovita Blvd. E and extending approximately 0.3 miles to the south. Vegetation includes black cottonwoods, willows, hardhack, reed canary grass and Himalayan blackberry. Approximate area is 3 acres and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is high and the overall condition ranking is high. Landscape scale avoidance is high based on the criteria that the condition of the movement of sediment, large wood and overall aquatic integrity are at risk and the upslope forest is intact. The GIS identification number is 1539.

Wetland AAE-28 is a PSS/PFO riverine flow-through system south of Stewart Road on the east side of SR-167. Vegetation consists of black cottonwood, red alder, blackberries, and reed canary grass. Approximate area is 3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment, the movement of large wood and the overall aquatic integrity are at risk and the location does not meet the high criteria. The GIS identification number is 3142.

Wetland AAE-29 is a PEM/PSS/PFO depressional flow-through system between Stewart Road on the south and 3<sup>rd</sup> Ave. SW on the north. Vegetation consists of black cottonwood, red alder, blackberry and reed canary grass. Approximate area is 20 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1537.

Wetland AAW-5A is a PEM riverine flow-through ditch between 3<sup>rd</sup> Ave. SW and extending south to where it flows under the Jovita Blvd. E. underpass. Vegetation consists mainly of reed canary grass, Himalayan blackberry, cattail and grasses, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall

condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3131.

### **Segment 3**

Wetland AAE-30 is a PEM riverine flow-through ditch extending from 3<sup>rd</sup> Ave. SW to Frontage Rd. The dominant vegetation is reed canary grass, with some Himalayan blackberry and willows, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3143.

Wetland AAE-30A is a PEM riverine flow-through ditch extending from Frontage Road north to Ellingson Road. Vegetation consists of reed canary grass, Himalayan blackberry and willows, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3144.

Wetland AAW-5 is a PEM/PSS riverine flow-through ditch between Ellingson Road and extending south to where it flows under the 3<sup>rd</sup> Ave SW. underpass. Vegetation consists mainly of reed canary grass with a few cottonwood, red alder, willows, Himalayan blackberry and cattail, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3130.

Wetland AAW-4A is a PEM riverine flow-through ditch between the mainline and the northbound on-ramp from Ellingson Road. Vegetation consists mainly of reed canary grass, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 1531.

Wetland AAW-4 is a PEM depressional flow-through site between the mainline and the southbound off-ramp to Ellingson Road. Vegetation includes soft rush and grasses. Approximate area is 0.2 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1532.

Wetland AAE-30B is a PEM riverine flow-through ditch extending from Ellingson Road north to 1st Ave. N. Vegetation consists of reed canary grass, Himalayan blackberry and a few cottonwoods, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3145.

Wetland AAW-3A is a PEM riverine flow-through ditch from the 1<sup>st</sup> Ave. North underpass and extending south to where it flows under the Ellingson Road underpass. Vegetation consists mainly of reed canary grass and cattail, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3129.

Wetland AAE-30C is a PEM riverine flow-through ditch starting at 1st Ave. N. and extending north to where it enters Wetland BE-3S at Boundary Blvd. Vegetation consists of reed canary grass, Himalayan blackberry and a few cottonwoods, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3146.

Wetland AAW-3 is a PEM riverine flow-through ditch extending from Wetland AAW-2 south to where it flows under the 1<sup>st</sup> Ave. North underpass. Vegetation consists mainly of reed canary grass and cattail, and because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3128.

Wetland AAW-2 is just south of AAW-1 and is a PEM/PSS/PFO depressional flow-through system. Vegetation includes black cottonwood, red alder, reed canary grass and cattail. Approximate area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest and wetlands are intact and the location does not meet the high criteria. The GIS identification number is 3001.

Wetland AAE-35 is a PEM depressional flow-through system located just between 4<sup>th</sup> and 5<sup>th</sup> Ave. N just west of Algona Blvd. S. Street E. and on the east side of SR-167. The main vegetation is reed canary grass and blackberry. Approximate area is 5 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3007.

Wetland AAW-1 is a PEM/PSS/PFO riverine flow-through system on the west side of SR-167 and south of 15<sup>th</sup> Street SW. Vegetation includes black cottonwood, red alder, hardhack, reed canary grass and cattail. Approximate area is 2 acres and the Ecology Rating is a Category II by the new rating system based on opportunity. The original rating in the delineation report was a Category III. For avoidance and minimization purposes, the site condition is high, landscape condition is moderate and the overall condition ranking is moderate/high. Landscape scale avoidance is moderate/high based on the criteria that the condition of the movement of sediment is at risk, the up-

slope forest and wetlands are intact and the location does not meet the high criteria. The GIS identification number is 3000.

Wetland BM-1 is a PEM depressional flow-through site located in the median south of 15<sup>th</sup> Street SW. The dominant plants are reed canary grass and soft rush, with cattail and hardhack as the non-dominant plants. Approximate area is 1 acre and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1528.

Wetland BE-0 is a PEM depressional flow-through site between the mainline and the northbound off-ramp to 15<sup>th</sup> Street SW. Dominant plants are reed canary grass and giant horsetail. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1527.

Wetland BE-3S is a PEM/PSS depressional flow-through system just east of the northbound off ramp to 15<sup>th</sup> Street SW. Vegetation consists of black cottonwood, Pacifica and Sitka willow and hardhack. Reed canary grass, cattail and duckweed are included in the herbaceous layer. Approximate area is 6 acres and the Ecology Rating is a Category III. This site has restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 878.

Wetland BW-8 is a PEM depressional flow-through site located between the mainline and the southbound on-ramp from 15<sup>th</sup> Street NW. The dominant vegetation includes reed canary grass, stinging nettle, and cattail. Soft rush, duckweed and Canadian thistle are the non-dominant plants. Approximate area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3021.

Wetland BW-6 is a PEM depressional flow-through site located between the mainline and the southbound off-ramp to 15<sup>th</sup> Street SW. The vegetation is dominated by reed canary grass, creeping buttercup and giant horsetail. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest and wetland areas are intact and the location does not meet the high criteria. The GIS identification number is 1518.

Wetland BW-9 is a PEM/PSS riverine flow-through system located south of 15<sup>th</sup> Street NW and west of SR-267. The dominant shrubs are hardhack, red-osier dogwood and red alder. Reed canary grass and soft rush dominate the herbaceous plants. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest and wetland areas are intact and the location does not meet the high criteria. The GIS identification number is 3019.

#### **Segment 4**

Wetland BW-7 is a PEM depressional flow-through site located within the cloverleaf of the westbound on-ramp from 15<sup>th</sup> Street NW to southbound SR-167. Soft rush, reed canary grass and spike rush are the dominant plants. Approximate area is 0.1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1526.

Wetland BW-5 is a PAB/PEM/PSS/PFO depressional flow-through system on the west side of SR-16 and between the interchanges of SR-18 and 15<sup>th</sup> Street NW and just south of Wetland BW-4. Algona Creek enters the wetland near the south end and flows northerly towards Mill Creek near the junction of Peasely Canyon Road and the West Valley Highway. Vegetation is similar to Wetland BW-4, and this is an existing mitigation site for Stage 2 construction. Approximate area is 14 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest and wetland areas are intact and the location does not meet the high criteria. The GIS identification number is 1518.

Wetland BE-1 is a PEM depressional flow-through site between two northbound ramps on the north side of 15<sup>th</sup> Street NW. Vegetation includes hardhack, Pacific willow, black cottonwood, Himalayan blackberry and patches of cattails. Approximate area is 2 acres and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1524.

Wetland BE-3N is a PEM/PSS depressional flow-through system between 15<sup>th</sup> Street NW and SR-18. Dominant vegetation includes black cottonwood, Pacific willow, Sitka willow and hardhack. Herbaceous plants include reed canary grass and cattail. Approximate area is 13 acres and the Ecology Rating is a Category II. This site has restoration and mitigation potential. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condi-

tion of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1521.

Wetland BW-4 is a PAB/PEM/PSS/PFO system on the west side of SR-16 and between the interchanges of SR-18 and 15<sup>th</sup> Street NW. Algona Creek enters the wetland near the south end and flows northerly towards Mill Creek near the junction of Peasely Canyon Road and the West Valley Highway. Water smartweed is the dominant aquatic bed plant while reed canary grass, cattail and creeping buttercup constitute the dominant plants of the emergent class. Sitka willow and hardhack dominate the shrub layer. The forested class contains black cottonwood, red alder, Pacific willow for its dominant plants. Approximate area is 14 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest and wetland areas are intact and the location does not meet the high criteria. The GIS identification number is 1519.

Wetland BE-2 is a PEM depressional flow-through site located between the mainline and the northbound exit ramp to SR-18. Vegetation includes black cottonwood, Sitka willow and hardhack. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1523.

Wetland BE-4 is a PEM depressional flow-through system located in the between the mainline and the on ramp from SR-18 to SR-167. The dominant vegetation is reed canary grass and soft rush. Approximate area is 2 acres and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1516.

Wetland BW-3 is a PEM/PFO riverine flow-through system within the cloverleaf of the off-ramp from southbound SR-16 to SR-18. Black cottonwood and Pacific willow dominate the overstory while Sitka willow is the dominant woody understory plant. The dominant emergent plants are reed canary grass, soft rush, creeping buttercup and giant horsetail. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1517.

Wetland BE-4N is a PEM depressional flow-through system located between SR-18 and the on ramp from SR-167 to SR-18. The dominant plant is reed canary grass, but other non-dominant plants include Pacific willow, black cottonwood, hardhack, clustered rose and elderberry. Non-dominant emergent plants include cattail, stinging nettle, climbing nightshade, soft rush, creeping buttercup, giant horsetail and chickweed.

Approximate area is 3 acres and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1515.

Wetland BW-2 is a PEM depressional flow-through site within the cloverleaf of the on-ramp from westbound SR-18 to southbound SR-167. This very small wetland is dominated by soft rush, reed canary grass and cattail. Approximate area is 0.1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3105.

Wetland BE-5 is a PEM depressional flow-through site located in the cloverleaf between the mainline and the northbound on-ramp from SR-18 to SR-167. The dominant plants are reed canary grass and soft rush. Approximate area is 1 acre and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 1514.

Wetland BE-6 is a PEM/PSS depressional flow-through system located east of the mainline and north of SR-18. The principal woody plants are Sitka willow and Pacifica willow with the dominant herbaceous plants. Approximate area is 1 acre and the Ecology Rating is a Category III. This site has some restoration potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3017.

Wetland BW-1 is a PAB/PEM/PSS/PFO system situated between 15<sup>th</sup> Street NW and West Main Street. Dominant herbaceous vegetation includes reed canary grass, soft rush, creeping buttercup, and small-fruited bulrush. Woody vegetation includes red-osier dogwood, hardhack, and Himalayan blackberry, with some Pacific willow and Scouler willow. Cattails are present in a small percentage of the overall cover. Approximate area is 12 acres and the Ecology Rating is a Category II. This is an existing mitigation site for Emerald Downs. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 936.

Wetland BW-1A is a PEM/PSS depressional flow-through system just south of West Main Street and is an existing mitigation site for Stage 1. Vegetation includes soft rush, reed canary grass, creeping buttercup and willows. Approximate area is 8 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes,

the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3022.

Wetland AW-11 is PSS riverine flow-through system between W. Main Street on the south end and 15<sup>th</sup> Street NW on the north end. The dominant vegetation is shrub, and composed of red-osier dogwood, hardhack, Pacific willow and Scouler willow. Plants in the emergent layer include reed canary grass, soft rush, velvet grass, giant horsetail and cattails. This site has been proposed for an HOV Stage 3 Mitigation site (personal communication with Bill Null, wetland biologist). Approximate area is 124 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1513.

Wetland AE-1 is a PSS depressional flow-through system located east of SR-167 between West Main Street and 15<sup>th</sup> Street NW of Auburn. Overstory consists of black cottonwood and shrubs include red-osier dogwood, hardhack and Pacific willow. Reed canary grass, soft rush and creeping buttercup are the dominant emergent plants. Area is approx. 89 acres and the Ecology Rating is a Category III. This wetland can be considered both a potential restoration and a mitigation site. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the wetland, although approximately 89 acres, has been hydrologically and vegetatively altered. The GIS identification number is 3023.

Wetland AE-1A is a PSS/PEM depressional flow-through system located west of SR-167 between West Main Street and SR-18. This wetland is a current mitigation site for Emerald Downs. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 947.

Wetland AAE-26 is a PEM/PSS riverine flow-through system between Wetland AAE-25 and extending to a point south of 24<sup>th</sup> Street E. Vegetation consists of Himalayan blackberry, reed canary grass, hardhack and black cottonwoods. Approximate area is 26 acres and the Ecology Rating is a Category III. This site has restoration and mitigation potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment, the movement of water and overall aquatic integrity are at risk and the location does not meet the high criteria. The GIS identification number is 1545.

Wetland AE-2 is a PEM depressional flow-through system situated between the northbound lanes of the mainline and the exit ramp on the south side of 15<sup>th</sup> Street NW. The dominant plants are reed canary grass, velvet grass and soft rush. Area is



approximately 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3031.

Wetland AW-10 is a very small PEM depressional flow-through site located between the mainline and the southbound on-ramp at 15<sup>th</sup> Street NW. The dominant vegetation is reed canary grass with codominants of velvet grass and soft rush. Other species present include cattail, hardhack and sedge. Approximate area is 0.1 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3030.

## **Segment 5**

Wetland AE-4A is a PEM depressional flow-through wetland located mainly in a ditch running from 15<sup>th</sup> Street NW to 29<sup>th</sup> Street NW. Vegetation consists of reed canary grass, creeping buttercup and soft rush. Because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3035.

Wetland AE-3 is a PEM depressional flow-through system situated between the northbound lanes of the mainline and the entrance ramp north of 15<sup>th</sup> Street NW. Dominant plants are velvet grass, reed canary grass and soft rush. Area is very small at 0.1 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3033.

Wetland AW-9 is a PEM depressional flow-through site between the southbound exit ramp to 15<sup>th</sup> Street NW and the mainline. The dominant plant is reed canary grass with co-dominants of velvet grass and soft rush. Other species present but in lesser quantities include cattail, sedge, and hardhack. Approximate area is 0.4 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3032.

Wetland AW-8 is a PSS riverine flow-through site located north of 15<sup>th</sup> Street NW and extends on the north end to 29<sup>th</sup> Street NW. This large system has Mill Creek running through the southern half of the site and contains red-osier dogwood and hardhack in the shrub layer. Emergent plants include reed canary grass, giant horsetail, cattail, soft rush, small-fruited bulrush and velvet grass. Approximate area is 35 acres, and the Ecology Rating is a Category II. This site has restoration and mitigation

potential. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 977.

Wetland AW-8A is a small PSS depressional flow-through site north of 29<sup>th</sup> St. NW and directly west of the mainline. The dominant vegetation is willow and the approximate area is 0.1 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3097.

Wetland AW-8B is a depressional flow-through swale north of 29<sup>th</sup> Street NW and between the mainline and some commercial buildings. Dominant vegetation is mainly willow and there is no Ecology rating since it is a swale. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a swale. The GIS identification number is 3043.

Wetland AW-8C is a depressional flow-through swale north of 29<sup>th</sup> Street NW and between the mainline and some commercial buildings. Dominant vegetation is mostly willow and there is no Ecology rating since it is a swale. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a swale. The GIS identification number is 3044.

Wetland AW-8D is a depressional flow-through swale north of 29<sup>th</sup> Street NW and between the mainline and some commercial buildings. Dominant vegetation is mainly willow and there is no Ecology rating since it is a swale. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a swale. The GIS identification number is 3045.

Wetland AW-8E is a PFO depressional flow-through site north of 29<sup>th</sup> St. NW in a commercial area and directly west of SR-167. Approximate area is 0.4 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3046.

Wetland AE-4 is a PSS depressional flow-through system located east of SR-167 between 29<sup>th</sup> St. SW and 37<sup>th</sup> St. NW. There are areas of black cottonwood present and the shrub layer includes hardhack and red-osier dogwood. Dominant herbaceous plants include creeping buttercup, cattail, reed canary grass and soft rush. Approximate area is 26 acres. In the original report this wetland was an Ecology Category III, but the newest Ecology Rating is II based on opportunity. This wetland can be a restoration and a mitigation site. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moder-

ate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 6488.

Wetland AE-4B is a PFO/PSS depressional flow-through wetland located just south of 37<sup>th</sup> Street NW and it surrounds a power sub-station. Overstory included black cottonwood and shrubs include willows. Approximate area 34 acres and the Ecology Category is III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3036.

Wetland AW-8F is a PSS riverine flow-through site just south of 37<sup>th</sup> St. NW and west of the mainline. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3047.

Wetland AE-5A is a PSS depressional flow-through wetland located just south of S. 285<sup>th</sup> Street. The dominant vegetation is shrub, and includes hardhack and red-osier dogwood. Reed canary grass and giant horsetail are the dominant herbaceous plants. Approximate area is 24 acres and the Ecology Category is III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3049.

Wetland AE-5D is a PEM depressional flow-through wetland located just north of S. 285<sup>th</sup> Street and is a current mitigation site with excavated ponds. Approximate area is 5 acres and the Ecology Rating is a III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3051.

Wetland AE-5C is a PSS depressional flow-through wetland located mainly in a ditch between S. 277<sup>th</sup> Street and S. 285<sup>th</sup> Street. Vegetation includes hardhack and red-osier dogwood, with reed canary grass and giant horsetails in the herbaceous layer. Approximate area is 44 acres and the Ecology Rating is III. This site has restoration and mitigation potential. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1057.

Wetland AW-7A is a PEM riverine flow-through system in agricultural fields just south of S. 277<sup>th</sup> Street. Mill Creek flows through it and most of the vegetation has

been cleared for pastureland. Approximate area is 6 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3058.

Wetland AW-7C is a PEM depressional flow-through site located in an agricultural field just north of S. 285<sup>th</sup> Street. The previous vegetation has been cleared for pastureland. Approximate area is 5 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1511.

Wetland AE-5B is a PEM depressional flow-through wetland located mainly in a ditch between S. 277<sup>th</sup> Street and S. 285<sup>th</sup> Street. Vegetation includes reed canary grass and willows. Because this is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3050.

Wetland AW-7B is a PEM depressional flow-through system located between the mainline and the southbound entrance ramp at S. 277<sup>th</sup> Street. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3059.

## **Segment 6**

Wetland AE-6 is a PEM depressional flow-through site between the northbound lanes and the on-ramp at 277<sup>th</sup> Street. The dominant vegetation is reed canary grass and soft rush with a few Scouler willow. Area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3060.

Wetland AW-6B is PEM depressional flow-through site situated in the cloverleaf between the southbound exit ramp to S. 277<sup>th</sup> Street and Sr-167. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3061.

AW-6 is a PEM/PSS riverine flow-through system just west of the southbound exit ramp to S. 277<sup>th</sup> Street. Black cottonwood, reed canary grass and giant horsetail are

found at this site and Mill Creek runs through it. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3062.

Wetland AE-7A is a PEM depressional flow-through system in a detention pond between the mainline and 72<sup>nd</sup> Ave. S. just north of S. 277<sup>th</sup> Street. Because this wetland is a detention pond it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 3076.

Wetland AE-7 is a PEM depressional flow-through system in a ditch along the mainline just north of S. 277<sup>th</sup> Street. The dominant plants are reed canary grass, giant horsetail and creeping buttercup and non-dominant plants include Scouler willow. Because this wetland is a ditch it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a ditch. The GIS identification number is 3077.

Wetland AE-7B is a PEM depressional flow-through system in a 2-cell detention pond between the mainline and 72<sup>nd</sup> Ave. S. and north of pond AE-7A near S. 277<sup>th</sup> Street. Because this wetland is a detention pond it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 3079.

Wetland AE-8 is a PEM depressional flow-through system on the east side of the mainline just south of SR-516. Dominant plants are reed canary grass, giant horsetail and hardhack. Area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3098.

Wetland AE-8A is a depressional flow-through 2-cell detention pond between the mainline and the northbound off-ramp just south of SR-516. Since it is a detention pond it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 3075.

Wetland AW-5A is a PEM depressional flow-through detention pond in the clover-leaf south of SR-516 and the southbound on-ramp to SR-167. Because this wetland is a detention pond it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 3074.

## Segment 7

Wetland AW-5 is a PEM/PSS depressional flow-through 2-cell detention pond located to the west of the southbound off-ramp to SR-516. Emergent plants include reed canary grass, creeping buttercup and curly dock. Because this wetland is a detention pond it does not have an Ecology Rating. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a detention pond. The GIS identification number is 1121.

Wetland AW-4 is a PFO depressional flow-through system just north of James Street on the west side of SR-167. Cottonwoods dominate the overstory and hardhack and Scouler willow dominate the shrub layer. Reed canary grass, soft rush and giant horsetail make up the herbaceous layer. Approximate area is 2 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1675.

Wetland AW-4A is a PFO/PSS depressional flow-through system situated to the north of Wetland AW-4 and just north of W. Morton Street. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3099.

Wetland AE-9 is a PFO depressional flow-through site along the toe of fill between James Street at the southerly end and the Union Pacific Railroad Tracks at the northerly end. It is approximately 0.7 acres in area. The overstory is dominated by black cottonwood, while the understory has Scouler willow and hardhack for dominant species. Dominant herbaceous plants are reed canary grass and giant horsetail. This wetland has an Ecology Rating of a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3100.

Wetland AW-3 is a PSS riverine flow-through system partially confined to a drainage ditch on the northwesterly side between 4<sup>th</sup> Ave. and the Union Pacific Railroad. The dominant woody shrubs are hardhack and red-osier dogwood. Reed canary grass, giant horsetail and soft rush, are the dominant emergent plants. Approximate area is 2 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3102.

Wetland N-4 is a PEM/PSS riverine flow-through system located south of Wetland N-3 and extending just north of 192<sup>nd</sup> Street on the west side of SR-167. Vegetation

includes red-alder and black cottonwood, and the dominant herbaceous plant is reed canary grass. The dominant woody plants are red-osier dogwood and Scouler willow. Approximate area is 10 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3104.

Wetland AW-2 is a PFO riverine flow-through system partially confined to a drainage ditch on the northwesterly side between 4<sup>th</sup> Ave. and the Burlington Northern Railroad. The dominant woody plants are black cottonwood in the shrub component. Emergent plants include reed canary grass, creeping buttercup and giant horsetail. Approximate area is 2 acres, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3101.

Wetland AE-10 is a PFO/PSS/PEM depressional flow-through system located between 4<sup>th</sup> Avenue and the Burlington Northern Railroad tracks in Kent. This wetland has been filled sometime between the 1995 report and the determination in December 2004. The report indicated that this was an Ecology Category II wetland, but it is presently a low Category III. Approximate area is 9 acres. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3104.

Wetland AE-11 is a PFO/PSS/PEM depressional flow-through system located between the Burlington Northern Railroad and a point 250 feet west of 84<sup>th</sup> Ave. S. This historically was an extension of Wetland AE-10 before the railroad was built and before AE-10 was filled in. It is dominated by black cottonwood, red alder, Pacific willow in the forested component and hardhack, red-osier dogwood and Himalayan blackberry in the scrub-shrub layer. Emergent plants include reed canary grass, giant horsetail, creeping buttercup and soft rush. Approximate area is 1 acre. Ecology rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1677.

Wetland AW-1 is a PFO riverine flow-through system partially confined to a drainage ditch on the northwesterly side of SR-167 between 84<sup>th</sup> Ave. S. and the Burlington Northern Railroad. The dominant woody plants are black cottonwood in the overstory and both hardhack and red-osier dogwood in the shrub layer. Emergent plants include reed canary grass, soft rush, creeping buttercup and giant horsetail. Approximate area is 1 acre, and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condi-

tion ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3103.

## **Segment 8**

Wetland Z-1 is a PEM/PSS riverine flow-through site beginning at the junction to 84<sup>th</sup> Avenue South and the on-ramp to northbound SR-167. Vegetation includes reed canary grass and cattail. Approximate area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3106.

Wetland T is a PEM riverine flow-through site extending from 84<sup>th</sup> Avenue South to S. 222<sup>nd</sup> Street on the west side of the mainline. Vegetation includes reed canary grass and Himalayan blackberry. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3107.

Wetland S is a PEM depressional flow-through system located to the west of SR-167 and just south of S. 218<sup>th</sup> Street. Dominant vegetation is reed canary grass, and the approximate area is 1 acre. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1687.

Wetland Z-2 is a PEM/PSS/PFO riverine flow-through system on the east side of SR-167 northbound off-ramp to S. 212<sup>th</sup> Street. Reed canary grass and cattail are the dominant herbaceous plants on the shoulder and in the ditch. Beyond the ditch is a forest dominated by red alder, Oregon ash and a few cottonwoods. The woody understory has red-osier dogwood and twinberry as the main plants. Approximate area is 13 acres and the Ecology Rating is a Category II. This can be considered a preservation site. For avoidance and minimization purposes, the site condition is high, landscape condition is moderate and the overall condition ranking is moderate/high. Landscape scale avoidance is moderate/high based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1214.

Wetland Q is a PEM/PSS riverine flow-through system located west of the southbound on-ramp from S. 212<sup>th</sup> Street to the mainline. Vegetation includes willows, hardhack and creeping buttercup. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement



of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3112.

Wetland R is a PEM/PSS riverine flow-through site located west of the mainline and underneath the overpass for S. 212<sup>th</sup> Street. Vegetation includes reed canary grass, Himalayan blackberry and giant horsetail. Approximate area is 2 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3113.

Wetland Z-3 is a PEM depressional flow-through site mainly in a ditch and is situated between the mainline and the northbound off-ramp to S. 212<sup>th</sup> Street. Dominant vegetation is reed canary grass, soft rush and cattail. Approximate area is 0.1 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3110.

Wetland Z3-A is a PSS depressional flow-through site between Wetland Z-3 and Wetland Z2-B. Vegetation includes Himalayan blackberry and willows and the approximate area is 0.2 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3111.

Wetland Z2-B is a PEM/PSS riverine flow-through site between the mainline and the northbound off-ramp to S. 212<sup>th</sup> Street. Vegetation includes reed canary grass, Himalayan blackberry and willows and the approximate area is 0.3 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is moderate and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are at risk, the upslope-forested area has minimal alteration, and the location does not meet the high criteria. The GIS identification number is 3109.

Wetland Z2-A is a PEM/PSS riverine flow-through site in the cloverleaf for the northbound on-ramp to the mainline from S. 212<sup>th</sup> Street. Vegetation includes reed canary grass and willows and the approximate area is 0.3 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is moderate and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment and large wood are at risk, the upslope-forested area has minimal alteration and the location does not meet the high criteria. The GIS identification number is 3108.

Wetland Z-4 is a PEM depressional flow-through swale north of S. 212<sup>th</sup> on the east side of the mainline. Vegetation includes reed canary grass, giant horsetail, cattail and

blackberry. There is no Ecology rating since this is a swale. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that this is a swale. The GIS identification number is 3114.

Wetland Z4-A is a PSS depressional flow-through system north of Wetland swale Z-4 and just south of the S. 208<sup>th</sup> Street overpass. Vegetation includes willows and blackberry and the approximate area is 1 acre. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is moderate and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk, the upslope forest has minimal alteration and the location does not meet the high criteria. The GIS identification number is 3115.

Wetland N-5 is a PEM/PSS/PFO riverine flow-through system situated south of 192<sup>nd</sup> Street and extending south to approximately S. 202<sup>nd</sup> Street on the west side of SR-167. Vegetation includes red alder, black cottonwood, Sitka willow, hardhack, and vine maple. Non-dominant plant species are lady-fern, climbing nightshade and stinging nettle. Approximate area is 6 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3117.

Wetland Z-5 is a PEM/PSS/PFO depressional flow-through site north of S. 200<sup>th</sup> Street and south of S. 55<sup>th</sup> Street on the east side of the mainline. The overstory is dominated by Pacific willow and red alder while the understory has Sitka willow as the dominant species. Herbaceous plants include creeping buttercup, reed canary grass, soft rush, skunk cabbage and duckweed. Approximate area is 6 acres and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3116.

Wetland Z-6 is a PEM/PSS/PFO depressional flow-through system and extends from S. 55<sup>th</sup> Street on the south for about one half mile north towards the northbound exit ramp to SW 43<sup>rd</sup> Street. Red alder dominates the overstory, black cottonwood and Oregon ash while Sitka willow and hardhack dominate the woody understory. Other shrub species include red-osier dogwood, red elderberry and cascara. The dominant herbaceous plants are reed canary grass and lady-fern while skunk cabbage and water parsley are present but in lesser amounts. Approximate area is 24 acres and the Ecology Rating is a Category II. This can be considered a preservation site. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 1290.

Wetland Z-7 is a PSS depressional flow-through site located under the S. 180<sup>th</sup> Street overpass between the mainline and the northbound off and on-ramps to 180<sup>th</sup>. Vegeta-

tion includes reed canary grass and willows, and the approximate area is 2 acres. The Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3118.

Wetland N-3 is a small PEM depressional flow-through site between the mainline and the southbound on-ramp from 180<sup>th</sup> Street. Vegetation includes reed canary grass, cattail and giant horsetail. Approximate area is 0.1 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3127.

### **Segment 9**

Wetland N-2 is a very small PEM depressional flow-through site on the west side of SR-167 near 180<sup>th</sup> Street. Reed canary grass is the dominant plant with some cattail in the ditch where there is standing water. Approximate area is 0.04 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3126.

Wetland N-1 is a PEM riverine flow-through system on the west side of the southbound lanes of SR-167 just north of S. 180<sup>th</sup> Street. The dominant vegetation is reed canary grass and Himalayan blackberry. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is moderate, landscape condition is low and the overall condition ranking is low/moderate. Landscape scale avoidance is low/moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3125.

Wetland P-5 is a PEM riverine flow-through system located west of SR-167 and just north of SW 41<sup>st</sup> Street. The dominant vegetation is reed canary grass with some giant horsetail. Approximate area is 0.3 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3124.

Wetland E-16 is a PEM/PSS depressional flow-through system located to the west of SR-167 between SE 43<sup>rd</sup> Street and the northbound on-ramp to I-405. This is a large groundwater discharge system at the base of a bluff to the east. Dominant vegetation includes willows, reed canary grass and creeping buttercup. Approximate area is 64 acres and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is moderate and the overall con-

dition ranking is moderate/high. Landscape scale avoidance is moderate/high based on the criteria that the condition of the movement of sediment is at risk, the wetland is greater than 50 acres and is properly functioning and the location does not meet the high criteria. The GIS identification number is 1344.

Wetland P-4 is a PEM/PSS/PFO riverine flow-through system on the west side of SR-167 and east of East Valley Highway behind commercial buildings. This wetland extends south for approximately a mile between SW 23<sup>rd</sup> Street on the north and SW 41<sup>st</sup> Street on the south. Black cottonwood and red alder dominate the overstory and the woody understory has red-osier dogwood, Sitka willow and hardhack. The dominant herb is reed canary grass, but giant horsetail, lady-fern and climbing nightshade are present as well. Approximate area is 7 acres and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3123.

Wetland W-1 is a PSS/PFO depressional flow-through site that occurs between Wetlands P-3 and P-4 near SW 23<sup>rd</sup> Street. Vegetation includes willow, red-osier dogwood and black cottonwood. Approximate area is 1 acre and the Ecology Rating is a Category II. For avoidance and minimization purposes, the site condition is high, landscape condition is low and the overall condition ranking is moderate. Landscape scale avoidance is moderate based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the high criteria. The GIS identification number is 3122.

Wetland P-3 is a PEM riverine flow-through site south of Wetland P-2 along the west side of Sr-167 between SW 19<sup>th</sup> Street and SW 23<sup>rd</sup> Street. The dominant plant is reed canary grass, but hardhack and soft rush are present as well. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3121.

Wetland P-2 is a PEM riverine flow-through site on the west side at the end of the southbound on-ramp from I-405 to SR-167. The dominant plant is reed canary grass with a small amount of thimbleberry and hardhack. Approximate area is 0.2 acres and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3120.

Wetland P-1 is a PEM riverine flow-through site on the west side of the southbound on-ramp from I-405 to SR-167. The vegetation includes reed canary grass, horsetail and creeping buttercup. Approximate area is 1 acre and the Ecology Rating is a Category III. For avoidance and minimization purposes, the site condition is low, landscape condition is low and the overall condition ranking is low. Landscape scale avoidance is low based on the criteria that the condition of the movement of sediment

is at risk and the location does not meet the moderate or high criteria. The GIS identification number is 3119.

**Table E-1: Functional Assessment of Wetlands within the Project Area**

Notes:

- Letter denotes field ID and number denotes the GIS ID used on this project.
- X – This function is provided by the wetland
- P – Principal function provided by the wetland

[illegible]

Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
AE-8	1910		X	P											
AE-9	3100			P					X		X				
AE-10	3104								P						
AE-11	1677		X	X		P	X	X	X	X	X		X	X	
AW-1	3103			P					X						
AW-2	3101			P					X						
AW-3	3102			P					X						
AW-4	1675	X		X		P					X		X		
AW-4A	3099	X		P				X							
AW-6	3062							X	P			X			
AW-6A	3061	P						X	X						
AW-7A	3058	P										X			
AW-7B	3059	P							X						
AW-8	977	X	X	X	X	X	X	X	X	X	X	P	X		
AW-8A	3097								P	X					
AW-8E	3046								P	X					

Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
AW-8F	3047								P						
AW-9	3032	X							P						
AW-10	3030	X							P						
AW-11	1513	X	X	P		X		X		X					
BE-0	1527			P											
BE-1	1524	X		P					X						
BE-2	1523	P													
BE-3N	1521		X	X		X		X	X	P			X		
BE-3S	878		X	X		X		X	X	P			X		
BE-4	1516	P	X												
BE-4N	1515			P											
BE-5	1514	X	X	P		X				X					
BE-6	3017	P		X											
BM-1	1528	P		X											
BW-1	936		X	X	X	X	P	X	X	X		X			
BW-1A	3022	X									P				



Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
BW-2	3105			P											
BW-3	1517	P						X	X				X		
BW-4	1519			P					X						
BW-5	1518	X						X		X	P				
BW-6	1525	X	X	P		X									
BW-7	1526	P		X									X		
BW-8	3021			P											
BW-9	3019			P		X		X			X		X		
E-16	1344	X	X	P	X	X	X	X	X	X					
N-1	3125	P						X							
N-2	3126	P													
N-3	3127	P									X				
N-4	1304	P		X			X								
N-5	3117	P		X											
P-1	3119			P											
P-2	3120			P											

Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
P-3	3121			P											
P-4	3123	X		P			X	X	X						
P-5	3124	X		P											
Q	3112			P											
R	3113	P		X											
S	1687	X		P											
T	3107	X		P											
W-1	3122	X		P			X		X						
Z-1	3106	P		X											
Z-2	1214			X	X	P		X		X	X		X		
Z2-A	3108	P		X											
Z2-B	3109	P		X											
Z-3	3110		P	X											
Z3-A	3111	P							X						
Z4-A	3115	X		X			P	X	X	X					
Z-5	3116		X	X		X	P	X	X	X					

Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
<b>Z-6</b>	1290		X	X		X	<b>P</b>			X	X		X		
<b>Z-7</b>	3118	<b>P</b>		X											
<b>LL</b>	1936	<b>P</b>		X			X						X		
<b>AAW-1</b>	3000	<b>P</b>		X			X						X		
<b>AAW-2</b>	3001	<b>P</b>		X											
<b>AAW-4</b>	1532	<b>P</b>		X											
<b>AAW-6A</b>	1539	<b>P</b>		X	X		X						X		
<b>AAW-6B</b>	3132	X			X	X	X	X		X			X		
<b>AAW-8</b>	3134	<b>P</b>		X					X						
<b>AAW-9</b>	1542	<b>P</b>	X	X					X						
<b>AAW-10</b>	3135						<b>P</b>						X		
<b>AAW-11</b>	1543	<b>P</b>		X					X						
<b>AAW-13</b>	1544	<b>P</b>		X	X		X		X						
<b>AAW-14</b>	1548	<b>P</b>		X	X										
<b>AAW-16</b>	507	X		X			X	X	X	X	<b>P</b>				
<b>AAW-17</b>	1551	<b>P</b>		X									X		

Wetland ID	GIS ID	Flood flow alteration	Sediment removal	Nutrient and toxicant removal	Erosion control and shoreline stabilization	Production of organic matter and its export	General habitat suitability	Habitat for aquatic invertebrates	Habitat for amphibians	Habitat for wetland-associated mammals	Habitat for wetland-associated birds	General fish habitat	Native plant richness	Educational or scientific value	Uniqueness and heritage
AAW-19	542	P		X											
AAW-20	570	P	X	X											
AAW-21	590	X				X	P								
AAE-22	495			P											
AAE-23	3139	X	X	P											
AAE-24	504	X	X	P											
AAE-26	1545	X	X	P											
AAE-28	3142	P	X	X		X	X								
AAE-29	1537	P	X	X											
AAE-31	1422	X	X	P											
AAE-32	1418	X	X	P											
AAE-33	1419	X	X	P											



# Wetland Avoidance and Minimization Ranking

## Introduction

Wetland regulations dictate that efforts are made to avoid and minimize impacts to wetland resources. The purpose of this report is to develop wetland avoidance and minimization rankings for each wetland on or adjacent to the project area. This information is developed to provide project planning and design teams with a sound natural resource decision-making tool that helps them meet regulatory requirements in a more defensible technically-based manner. During the project planning and design phases, maps showing the location and extent of wetlands can be used to help develop scenarios that maximize wetland avoidance. However, when wetlands occur on both sides of the highway and plans call for additional lanes, complete avoidance is not possible. In these cases, the avoidance and minimization condition rank for each wetland can be used to avoid or minimize impacts to the higher ranking site. This report summarizes methods used to rank individual wetlands for avoidance and minimization purposes and presents the results of this ranking process.

## Methods

Wetland avoidance and minimization ranking criteria are based on both the site- and landscape-scale condition of each wetland on or adjacent to the project area. General methods follow Gersib et al (2004).

At the site-scale, the Washington State Wetlands Rating System (Ecology 1993) was used by an experienced wetland biologist to assign a category rank for each wetland within the project limits of construction. For ranking purposes at a site-scale, Ecology Category I and Category II wetlands were considered to rank as a high priority, Category III wetlands as a moderate priority, and Category IV wetlands as a low priority.

The following criteria were developed and used to establish a landscape-scale condition rank for each wetland in the project area:

### **High Landscape Condition Rank:**

- a) site is not a ditch or detention pond, and
- b) 3 or more ecological processes are “At Risk” for the DAU, and
- c) upslope riparian and wetland areas are intact or have minimal alteration

or

- a) Moderate criteria are not met, and
- b) wetland size (>50 acres) and condition (intact) function to mitigate adverse upslope impacts

### **Moderate Landscape Condition Rank:**

- a) site is not a ditch or detention pond, and
- b) 3 or more ecological processes are “At Risk” for the DAU

or

- a) site is not a ditch or detention pond, and

- b) less than 3 ecological processes are “At Risk” for the DAU, and
  - c) upslope riparian and wetland areas are intact or have minimal alteration
- or
- a) site is not a ditch or detention pond, and
  - b) less than 3 ecological processes are “At Risk” for the DAU, and
  - c) wetland size (>50 acres) and site has some hydrologic and vegetative alteration (Hydro\_alt = 1 and Veg\_alt = 1)

**Low Landscape Condition Rank:**

- a) Artificial ditches, swales, and detention ponds
- or

- a) All sites not meeting Moderate or High criteria below

An overall avoidance and minimization rank was then developed by averaging the site-scale and landscape-scale rank for each wetland. Rules for averaging site- and landscape-scale scores are presented in Table E-2.

**Table E-2. Rules Used to Establish Overall Condition Rank for Wetlands.**

Site Condition	Landscape Condition	Overall Condition Rank
Low	Low	Low
Low	High	Moderate
Moderate	Low	Low-Moderate
Moderate	Moderate	Moderate
Moderate	High	Moderate-High
High	Low	Moderate
High	Moderate	Moderate-High
High	High	High-High
High	Low	Moderate

## Results

A total of 106 wetlands and 27 wetland ditches, swales, or detention ponds on or adjacent to the SR-167 project area. Results indicate that four wetlands have an overall condition rank of High, three wetlands ranked Moderate-High, 31 wetlands ranked Moderate, 36 wetlands ranked Low-Moderate, and 59 wetlands were ranked Low.

Individual wetland avoidance and minimization condition rank data area presented in Table E-3.

**Table E-3. Project Area Wetland Avoidance/Minimization Site Data.**

<b>Field id</b>	<b>Wetland_id</b>	<b>Wclass</b>	<b>Pclass</b>	<b>Avoidance Site/Land/ Overall</b>	<b>Ecology Category</b>	<b>Dau_code</b>
AAE-36	1420	DF	DF	M-M-M	3	227
AAE-35	3007	DF	DF	M-L-L/M	3	231
AAE-34	1541	DF	DF	M-L-L/M	3	218
AAE-33	1419	DF	DF	M-L-L/M	3	227
AAE-32	1418	DF	DF	M-L-L/M	3	227
AAE-31	1422	DF	DF	M-M-M	3	227
AAE-30C	3146	RF	RF	L-L-L	Ditch - does not rate	218
AAE-30B	3145	RF	RF	L-L-L	Ditch - does not rate	218
AAE-30A	3144	RF	RF	L-L-L	Ditch - does not rate	218
AAE-30	3143	RF	RF	L-L-L	Ditch - does not rate	218
AAE-29	1537	DF	DF	M-L-L/M	3	218
AAE-28	3142	RF	RF	M-M-M	3	217
AAE-27	3141	RF	RF	L-L-L	Ditch - does not rate	218
AAE-26	1545	RF	DF	M-M-M	3	219
AAE-25	3140	RF	RF	L-L-L	Ditch - does not rate	219
AAE-24	504	DF	DF	M-L-L/M	3	227
AAE-23	3139	DF	DF	M-L-L/M	3	235
AAE-22	495	RF	RF	M-L-L/M	3	196
AAW-21A	3204	SL	SL	M-M-M	3	219
AAW-21	590	RF	RF	H-H-H	2	219



Field id	Wetland_id	Wclass	Pclass	Avoidance Site/Land/ Overall	Ecology Category	Dau_code
AAW-20	570	DF	DF	M-M-M	3	219
AAW-19	542	DF	DF	M-M-M	3	219
AAW-19	542	DF	DF	M-M-M	3	219
AAW-18	3138	DF	DF	L-L-L	Detention Pond	235
AAW-17	1551	DF	DF	M-L-L/M	3	235
AAW-16	507	DF	DF	H-L-M	2	235
AAW-15	3137	RF	RF	L-L-L	Ditch - does not rate	219
AAW-14	1548	DF	DF	M-M-M	3	219
AAW-13	1544	RF	RF	M-M-M	3	219
AAW-12	3136	RF	RF	L-L-L	Ditch - does not rate	218
AAW-11	1543	RF	RF	M-M-M	3	219
AAW-10	3135	DF	DF	H-H-H	2	218
AAW-9	1542	RF	RF	M-M-M	3	218
AAW-8	3134	RF	RF	M-L-L/M	3	218
AAW-7	3133	RF	RF	L-L-L	Ditch - does not rate	218
AAW-6B	3132	RF	RF	H-M-M/H	2	217
AAW-6A	1539	RF	RF	H-H-H	2-Barely by new rating	217
AAW-5A	3131	RF	RF	L-L-L	Ditch - does not rate	218
AAW-5	3130	RF	RF	L-L-L	Ditch - does not rate	218
AAW-4A	1531	RF	RF	L-L-L	Ditch - does not rate	218
AAW-4	1532	DF	DF	L-L-L	Low 3	218

Field id	Wetland_id	Wclass	Pclass	Avoidance Site/Land/ Overall	Ecology Category	Dau_code
AAW-3A	3129	RF	RF	L-L-L	Ditch - does not rate	218
AAW-3	3128	RF	RF	L-L-L	Ditch - does not rate	218
AAW-2	3001	DF	DF	M-M-M	3	218
AAW-1	3000	RF	RF	H-M-M/H	2-Barely by new rating	218
Z-7	3118	DF	DF	L-L-L	3	209
Z-6	1290	DF	DF	H-L-M	2	35
Z-5	3116	DF	DF	H-L-M	2	103
Z4-A	3115	DF	DF	M-M-M	3	119
Z-4	3114	DF	DF	L-L-L	Not rated	119
Z3-A	3111	DF	DF	L-L-L	3	222
Z-3	3110	DF	DF	L-L-L	3	119
Z2-B	3109	RF	RF	L-M-L/M	3	222
Z2-A	3108	RF	RF	L-M-L/M	3	222
Z-2	1214	RF	RF	H-M-M/H	2	119
Z-1	3106	RF	RF	L-L-L	3	119
W-1	3122	DF	DF	H-L-M	2	209
T	3107	RF	RF	L-L-L	3	119
S	1687	DF	DF	M-L-L/M	3	119
R	3113	RF	RF	L-L-L	3	119
Q	3112	RF	RF	L-L-L	3	119
P-5	3124	RF	RF	M-L-L/M	3	209
P-4	3123	RF	RF	H-L-M	2	209
P-3	3121	RF	RF	L-L-L	3	209

<b>Field id</b>	<b>Wetland_id</b>	<b>Wclass</b>	<b>Pclass</b>	<b>Avoidance Site/Land/ Overall</b>	<b>Ecology Category</b>	<b>Dau_code</b>
P-2	3120	RF	RF	L-L-L	3	209
P-1	3119	RF	RF	L-L-L	3	209
N-5	3117	RF	RF	H-L-M	2	119
BW-9	3019	RF	DF	M-M-M	3	163
E-16	1344	DF	DF	H-M-M/H	2	93
N-1	3125	RF	RF	M-L-L/M	3	163
N-2	3126	DF	DF	L-L-L	3	209
N-3	3127	DF	DF	L-L-L	3	209
N-4	1304	RF	RF	M-L-L/M	3	35
BW-8	3021	DF	DF	L-L-L	3	163
BW-7	1526	DF	DF	L-L-L	3	163
BW-6	1525	DF	DF	M-L-L/M	3	163
BW-5	1518	DF	DF	M-M-M	2	163
BW-4	1519	RF	DF	M-M-M	3	163
BW-3	1517	RF	RF	M-L-L/M	3	163
BW-2	3105	DF	DF	L-L-L	3	88
BW-1A	3022	DF	DF	M-L-L/M	3	88
BW-1	936	RF	DF	H-L-M	2	88
BM-1	1528	DF	DF	L-L-L	Low 3	163
BE-6	3017	DF	DF	M-L-L/M	3	88
BE-3S	878	DF	DF	M-L-L/M	3	163
BE-3N	15211522	DF	DF	H-L-M	2	163
BE-5	1514	DF	DF	L-L-L	3	88
BE-4N	1515	DF	DF	M-L-L/M	3	163

<b>Field id</b>	<b>Wetland_id</b>	<b>Wclass</b>	<b>Pclass</b>	<b>Avoidance Site/Land/ Overall</b>	<b>Ecology Category</b>	<b>Dau_code</b>
BE-4	1516	DF	DF	M-L-L/M	3	163
AW-8C	3044	DF	DF	L-L-L	Swale - Not rated	178
AW-8D	3045	DF	DF	L-L-L	Swale - Not rated	178
AW-8E	3046	DF	DF	M-L-L/M	3	178
AW-8F	3047	RF	RF	M-L-L/M	3	178
AW-9	3032	DF	DF	L/L/L	3	178
BE-0	1527	DF	DF	L-L-L	3	163
BE-1	1524	DF	DF	L-L-L	3	163
BE-2	1523	DF	DF	L-L-L	3	163
AW-8B	3043	DF	DF	L-L-L	Swale - Not rated	178
AW-8A	3097	DF	DF	L-L-L	3	178
AW-8	977	RF	DF	H-L-M	2	178
AW-7C	1511	NW	DF	M-L-L/M	3	181
AW-7B	3059	DF	DF	L-L-L	3	181
AW-7A	3058	RF	RF	M-L-L/M	3	181
AW-6B	3061	DF	DF	M-L-L/M	3	6
AW-6	3062	RF	RF	M-L-L/M	3	224
AW-5A	3074	DF	DF	L-L-L	Det. Pond - not rated	122
AW-5	1121	DF	DF	L-L-L	3 in Report. Det. Pond	122
AW-4A	3099	DF	DF	M-L-L/M	3	123
AW-4	1675	DF	FG	M-L-L/M	3	123
AW-3	3102	RF	RF	L-L-L	3	123

Field id	Wetland_id	Wclass	Pclass	Avoidance Site/Land/ Overall	Ecology Category	Dau_code
AW-2	3101	RF	RF	L-L-L	3	123
AE-6	3060	DF	DF	L-L-L	3	6
AE-7	3077	DF	DF	L-L-L	Ditch - not rated	6
AE-7A	3076	DF	DF	L-L-L	Det. Pond - Does not rate	6
AE-7B	3079	DF	DF	L-L-L	Det. Pond - Does not rate	6
AE-8	3098	DF	DF	L-L-L	3	122
AE-8A	3075	DF	DF	L-L-L	Det. Pond - Does not rate	6
AE-9	3100	DF	DF	M-L-L/M	3	123
AW-1	3103	RF	RF	L-L-L	3	221
AW-10	3030	DF	DF	L-L-L	3	38
AW-11	1513	RF	DF	M-L-L/M	2	88
AE-5D	3051	DF	DF	M-L-L/M	3	117
AE-5C	1057	DF	DF	M-L-L/M	3	117
AE-5B	3050	DF	DF	L-L-L	Ditch - not rated	117
AE-5A	3049	DF	DF	M-L-L/M	3	181
AE-4B	3036	DF	DF	M-L-L/M	3	178
AE-4A	3035	DF	DF	L-L-L	Ditch - not rated	178
AE-4	6488	DF	DF	H-L-M	2	178
AE-3	3033	DF	DF	L-L-L	3	178
AE-2	3031	DF	DF	L-L-L	3	88
AE-11	1677	DF	DF	M-L-L/M	3	221
AE-10	3104	DF	DF	M-L-L/M	3	123

<b>Field id</b>	<b>Wetland_id</b>	<b>Wclass</b>	<b>Pclass</b>	<b>Avoidance Site/Land/ Overall</b>	<b>Ecology Category</b>	<b>Dau_code</b>
AE-1A	947	DF	DF	H-L-M	2	88
AE-1	3023	DF	DF	M-M-M	3	88

## Fragmentation of Hydrologic Resources in the SR-167 Project Area

Figures 63, 64, 65, and 66 (in the main body of this document) show locations where the existing highway is fragmenting hydrologic resources in the SR-167 project area. Roads play a significant role in the fragmentation of wetlands, seepage and recharge zones, floodplains, and alluvial fans. Road fill and drainage systems often disrupt natural flow paths, and isolate or limit the exchange of water, nutrients, and organisms between wetland ecosystems. This can cause changes in wetland hydroperiods that seriously impair wetland functions (Azous and Horner, 1997).

Highway drainage systems may also intercept seepage and groundwater flow paths. Paved and compacted surfaces prevent water from infiltrating into underlying soils. These landscape changes can significantly reduce recharge to alluvial aquifers and wetlands. They also reduce dry-season streamflows that are fed by groundwater, leading to impaired fish habitat, low dissolved oxygen levels, and elevated water temperatures (Poole and Berman, 2001).

Roads may significantly limit the movement of floodwaters and restrict natural geomorphic processes in streams. Stream crossing structures confine the natural floodplain and limit the ability of channels to migrate (Washington State Department of Fish and Wildlife, 2003). Road approaches are often built on fill that eliminates floodplain storage, wetlands, and riparian habitat. Undersized culverts and bridges concentrate flow and cause bank erosion and channel incision downstream of the highway. They also block the movement of wood and debris, and contribute to road flooding and streambed aggradation upstream of the highway.

Roads that parallel rivers may act as levees, decoupling historically flooded areas from the active floodplain. This reduces the amount of storage provided by the floodplain, and increases flood risks and stream erosion downstream. Restoration of decoupled and confined floodplain areas provides opportunities to mitigate impacts to floodplain storage. This is especially important in counties that have strict compensatory flood storage requirements.

Alluvial fans present a special case in floodplain confinement. These fan-shaped sediment deposits form where steep tributary streams transition onto the valley floor. The high rate of sediment deposition on alluvial fans causes channels to braid and migrate. This creates diverse habitat and provides a steady source of diffuse flow to wetlands and alluvial aquifers. Highways often confine alluvial fan channels into a single crossing structure, effectively eliminating natural channel dynamics. These single crossing structures may also clog with debris, resulting in costly road flooding and channel maintenance.

Reducing hydrologic fragmentation can be an important component of mitigation projects. Impacts to groundwater recharge can be addressed using BMPs for stormwater infiltration. Seepage zones can be reconnected to alluvial aquifers and downslope wetlands using subsurface drainage systems that convey water through the highway prism. Floodplain confinement and decoupling can be addressed by replacing undersized stream crossing structures. Alluvial fan dynamics can be restored using multiple crossing structures that allow channels to migrate and shift where they cross the

highway. Multiple culverts or bridges can also be used to connect wetland habitats and restore wetland flow paths through the highway prism.

## **Black/Springbrook**

SR-167 runs along the base of the bluff that divides the Covington uplands from the Green River valley floor. This geologic transition contains important seepage zones and groundwater recharge areas that are disrupted by the highway. The highway also crosses two alluvial fans at the mouths of ravines that drain the western edge of the Covington uplands. Wetlands cover the lower ends of these fans, just upslope of the highway. Wetlands associated with Panther Creek line the upslope side of the highway, but are generally not fragmented by the highway. The exception to this is the lower Panther Creek wetlands (near the SR-167/I-405 interchange), where the highway separates a relatively intact wetlands system from ponds and floodplain areas on the valley floor. Highway crossings confine the floodplains at the Mill and Garrison Creek crossings, but existing land uses upstream and downstream of the highway limit opportunities for restoration.

The potential for reducing hydrologic fragmentation in this subbasin is limited by the high level of urban development on the downslope side of the highway. There is potential to restore alluvial fan dynamics at two sites on the upslope side of the highway, which in turn would enhance wetland habitats and groundwater recharge. There is also potential to improve connectivity between the Panther Creek wetlands and valley floor wetlands near the SR-167/I-405 interchange. Seepage zones could be reconnected to the valley floor to enhance recharge of the Green River alluvial aquifer.

## **Lower Green West**

SR-167 crosses the Green River near Mill Creek. Because levees and reservoir operations have already disconnected the Green River from its floodplain, the SR-167 bridge causes no additional floodplain confinement or decoupling on the mainstem of the Green River.

## **Mill Creek**

SR-167 crosses an extensive complex of wetlands and floodplains that line Mill Creek. Mill Creek runs parallel to SR-167, and crosses the highway in two locations. At each of these crossings the highway confines the floodplain and blocks overbank flow paths. In several other locations the highway acts as a levee and decouples historical floodplain areas from Mill Creek. In most locations existing land uses preclude significant floodplain restoration, but there are three sites (HFF5, HFF6, and HFF9) where new crossing structures could be provided to link decoupled and confined floodplain areas. These sites also provide opportunities for reducing wetland fragmentation.

South of the SR-18 interchange the highway crosses an alluvial fan, but existing land uses on the fan limit restoration opportunities. Near the Green River the highway covers coarse alluvial soils that provide high rates of groundwater recharge. Most of the land adjacent to these areas is covered by pasture and undeveloped land, so there is potential to use stormwater infiltration BMPs to recover groundwater recharge lost from paved areas.



## **Lower White River West**

SR-167 runs along the base of the eastern bluff of the Federal Way uplands, and intersects a major seepage zone south of the SR-18 interchange. Near the White/ Puyallup confluence the highway covers several areas of coarse alluvial soils that provide high rates of groundwater recharge. Most of the adjacent lands are covered by pasture and undeveloped land, so there is potential to use stormwater infiltration BMPs to recover groundwater recharge lost from paved areas. The highway also crosses the base of several alluvial fans that emerge from ravines carved into the valley walls. Existing development severely constrains restoration of most of these alluvial fans, but there is potential to restore upslope alluvial fan processes on one forested fan (site HFA5). This would improve recharge to the valley floor aquifer and enhance a small wetland area downslope of the highway.

SR-167 impinges on the western edge of the White River floodplain near the Puyallup confluence, but fragments only a small portion of the historical floodplain. The highway bisects several wetland areas that have been hydrologically altered. Reducing fragmentation could be a part of wetland restoration projects at these sites.

## **Middle Puyallup North**

SR-167 crosses the valley floor throughout this subbasin, and has little interaction with wetlands, floodplains, seepage zones, or alluvial fans. There is one area where SR-167 overlies important recharge soils. Most of the land adjacent to the highway is covered by pasture and undeveloped land, so there is potential to use stormwater infiltration BMPs to recover groundwater recharge lost from paved areas.

## References for Appendix E

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